

# ALTRAN

## Mathematics & Statistics

Portable

**ALTRAN (Algebra Translator) is a language and system for symbolic computation or algebraic data. The system is highly portable and is designed to handle very large problems with considerable efficiency.**

**Key words and phrases:** mathematics, algebra, symbolic computation, formula manipulation.

ALTRAN's basic capability is performing rational operations on rational expressions in one or more indeterminates, with integer coefficients. The system is designed to handle very large problems involving such data with considerable efficiency.

Operations on integer, rational, and real (floating point) data are also included, and library procedures are provided for dealing with side relations, truncated power series, and systems of linear equations. Thus ALTRAN is likely to be appropriate for any symbolic computation which is well understood but tedious to perform. However, the user should beware of problems involving astronomical amounts of computing and/or output.

To simplify learning, the language includes only 16 distinct statements, most of them syntactically similar to corresponding statements in FORTRAN. The language incorporates a number of semantic concepts from PL/I.

Beginning programmers who are familiar with elementary algebra often find ALTRAN simpler, cleaner, and easier to learn than either FORTRAN or PL/I. The User's Manual has been carefully written to fulfill both tutorial and reference needs.

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**Available from Bell Labs Computing Information Service, Murray Hill, N.J. 07974:**

ALTRAN User's Manual (\$8)

ALTRAN Installation and Maintenance (\$6)

ALTRAN Reference Card (\$1)

Bibliography available on request.

**Hardware requirements:**

Portable (150,000 to 300,000 bytes)

**Programming language:** ANSI FORTRAN

**License fees:**

\$2,000 (per data center)

For more information, contact the Technology Licensing Manager, AT&T, P.O. Box 25000, Greensboro, North Carolina 27420 or call (919) 697-6530



# PCAP

## Mathematics & Statistics

(Manufacturing Aid)  
Portable

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**PCAP (Process Characterization Analysis Package) is a comprehensive computer program package used in analyzing, characterizing and controlling processes and systems. It is useful in simplifying manufacturing optimization and control problems and may have an impact on the economics of manufacture.**

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PCAP is an integrated collection of statistical techniques, designed to assist in obtaining a thorough characterization of a manufacturing process. Using data collected during the normal course of production and testing, or from experimental runs, PCAP allows engineers to systematically identify the significant process variables, the interactions among them, and their operating regions for maximum yields. Additionally, PCAP allows the engineer to develop process models and to determine in-process screening limits for minimum product costs.

PCAP has been used on problems associated with the manufacture of remred sealed contacts, silicon materials, silicon integrated circuits, RC linear hybrid circuits, cable, transistors, diodes, printed circuit boards and tantalum capacitors. New applications are continually being added.

PCAP has also been used to analyze data not associated with manufacturing processes. It can be employed to assist management in preparing a Corporate Planning policy, to analyze personnel data in order to identify trends and relationships relative to various organizational operations, or to analyze any data which contains identifiable variables that impact on other variables.

The program can be used in both the batch and interactive modes. PCAP has been designed with "portability" as a major design requirement. To date, it has been successfully installed on a DEC PDP-10, the IBM 360/370, the Xerox Sigma 9, and the Honeywell 6000 computer systems.

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**Published references:**

The Western Electric Engineer,  
Special Issue: Process Characterization  
Analysis Package (PCAP)  
July 1978

**Hardware requirements:** Portable

**Programming language:** ANSI FORTRAN

**License fee:**

**Source Code License**  
\$50,000 (first CPU)  
\$25,000 (each additional CPU)

Information on Timesharing available  
upon request.

For more information, contact the Technology Licensing Manager, AT&T, P.O. Box 25000, Greensboro, North Carolina 27420 or call (919) 697-6530



# MINI-PCAP

## Mathematics & Statistics

(Manufacturing Aid)  
Portable

**MINI-PCAP is a scaled-down version of PCAP (Process Characterization Analysis Package), a comprehensive computer program package used in analyzing, characterizing and controlling processes and systems. It is useful in simplifying optimization and control problems in manufacturing and can therefore impact the economics of manufacture.**

MINI-PCAP is basically a version of PCAP modified to execute on a mini-computer, while incorporating all the features of PCAP. However, mini-computer hardware restrictions reduce the number of variables and the data set size that can be analyzed by MINI-PCAP, as compared to PCAP.

MINI-PCAP is an integrated collection of statistical techniques designed to assist in obtaining a thorough characterization of a manufacturing process. Using data collected during the normal course of production and testing, or from experimental runs, MINI-PCAP assists users in identifying significant process variables, their interactions and operating regions for maximum yields. Additionally, MINI-PCAP can be used to develop process models and to determine in-process screening limits to help to minimize product costs.

PCAP and MINI-PCAP have been used on problems associated with the manufacture

of, among other things, sealed contacts, silicon materials, silicon integrated circuits, RC linear hybrid circuits, cables, transistors, diodes, printed circuits and tantalum capacitors.

MINI-PCAP can also be used to analyze types of data not associated with manufacturing processes. For example, it can be employed to assist management in preparing a Corporate Planning policy, to analyze personnel data, to identify trends and relationships relative to various organizational operations — in short, to analyze any data which contains identifiable variables that impact on other variables.

MINI-PCAP is used in the interactive mode. It has been designed with "portability" as a major requirement and to date has been successfully installed on the mid-range of DEC PDP-11 mini-computers.

**Published references:**

The Western Electric Engineer,  
Special Issue: Process Characterization  
Analysis Package (PCAP)  
July 1978

**Hardware requirements:** Portable

**Programming languages:** ANSI FORTRAN

**License fees:**

Source Code License  
\$40,000 (first CPU)  
\$20,000 (each additional CPU)

For more information, contact the Technology Licensing Manager, AT&T, P.O. Box 25000, Greensboro, North Carolina 27420 or call (919) 697-6530



# PORT Mathematics & Statistics

Portable

**PORT (Portable Mathematical Subroutine Library)** is a coordinated set of FORTRAN subprograms for numerical computation. The library is characterized by careful error checking and dynamic storage allocation, and can be installed on computers, including minicomputers, which have an ANSI FORTRAN compiler with associated library facilities.

**Key words and phrases:** mathematics, numerical computation, subroutine library.

PORT has been installed on computers such as the CDC 6000/7000, Data General Eclipse, Harris S220, Honeywell 600/6000, IBM 360/370, PDP 10, PDP 11, and UNIVAC 1100. Installation of PORT is a simple procedure because the programs in the library are written portably, using named machine constants which are defined for various classes of computers.

The second edition of PORT includes several programs which outperform other candidates in their area of numerical computation. Extensive spline approximation and interpolation facilities are provided, a new rational approximation program is presented, and two new programs for obtaining the

zeros of nonlinear equations are included. The library contains a set of integration routines which can integrate "noisy" integrands or integrands with a singularity, and it also provides programs, built around an efficient and robust extrapolation algorithm, for solving ordinary differential equations.

Many other programs are provided in various standard areas of numerical computation, and several types of utility routines are included. The library is modular in structure and provides a good basis for general program development.

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**Available from Bell Labs Computing Information Service, Murray Hill, N.J. 07974:**

**PORT User's Manual.** (\$20)

**PORT Mathematical Subroutine Library,** Computer Science Technical Report #47, Bell Laboratories, May 1, 1977.

**Hardware requirements:** Portable

**Programming languages:** ANSI FORTRAN

**License fees:**

\$3,500 (first central processing unit)  
1,750 (each additional CPU)

For more information, contact the Technology Licensing Manager, AT&T, P.O. Box 25000, Greensboro, North Carolina 27420 or call (919) 697-6530



# ANAPAC Mathematics & Statistics

IBM 360/370  
Honeywell 600

**ANAPAC (Analysis Package for Integrated Circuit Test Data) is a package of programs that facilitates the analysis of test data on integrated circuit wafers.**

**Key words and phrases:**  
**circuit design, test data analysis.**

ANAPAC is a package of computer programs that facilitates the analysis of parametric test data on integrated circuits. ANAPAC has been designed to accept test data from a wide range of automatic test machines.

Wafer maps, histograms, and statistical analyses are among the analytical programs ANAPAC features. The user merely specifies—via a simple input language—which of the available analyses are to be done on which portion of the test data. Input to ANAPAC is free-format and mnemonic.

More complex analyses may be performed by writing a "pluggable" FORTRAN subroutine.

Output summaries by slice and by lot are provided automatically on the line printer.

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**Available from Bell Labs Computing Information Service, Murray Hill, N.J. 07974:**

"ANAPAC, An Analysis Package for Integrated Circuit Test Data," Blue, J. L., Bell Laboratories, July 3, 1972. (\$7)

"ANAPAC, I/O Features," Bell Laboratories, July 2, 1975, (for use on Honeywell 6000 Computer). (\$2)

**Hardware requirements:**  
IBM 360/370, Honeywell 600/6000

**Programming language:** FORTRAN

**License fee:**  
\$20,000 (per central processing unit)

For more information, contact the Technology Licensing Manager, AT&T, P.O. Box, 25000, Greensboro, North Carolina 27420 or call (919) 697-6530

